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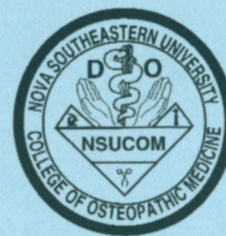


# M<sup>edical Education Digest</sup>

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## Motor Vehicle Crashes and Near Misses After Extended Shifts by Interns



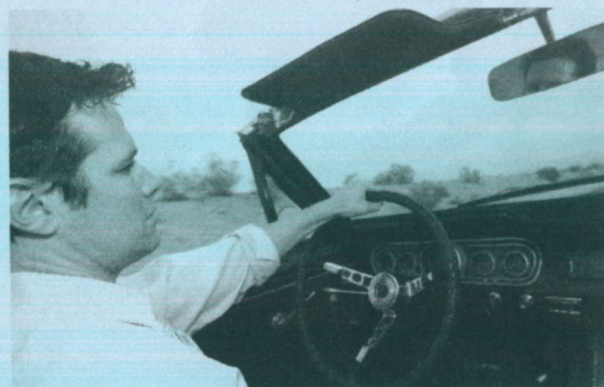
A Harvard study reported that after an extended shift, interns had 320 motor-vehicle crashes commuting from work, of which 133 were of some consequence. Crashes of consequence were those that led to emergency-room treatment, the filing of a police report, and/or where there was \$1,000 or more of property damage. This was significantly greater than in interns commuting from work after nonextended shifts. These crashes occurred with a similar pattern after extended shifts and nonextended shifts for both the time of day and day of the week.

The risk of near misses was also significantly different after extended shifts compared to nonextended shifts. It was also found that during months when interns had five or more extended shifts, there was a significant increase in the likelihood they would fall asleep while driving or stopped in traffic. As part of the Harvard Work Hours, Health, and Safety Group studies, 3,429 interns volunteered to participate, of whom 2,737 or 80 percent completed a baseline survey. Of these, 93 percent completed at least one monthly survey and 82 percent two monthly surveys. A total of 19,740 surveys were collected, including 2,737 baseline surveys and 17,003 monthly surveys.

As a result of the data collected and the analysis that was performed, it was concluded that after an extended shift, the odds that interns will have a documented motor crash doubled compared to those who completed nonextended hour shifts. In addition, the odds of a near miss were five times as likely to occur after an extended shift. It was found that in the 2002-2003 academic year, 46.2 percent of the interns in the study worked more than 80 hours weekly and 11 percent more than 100 hours. Furthermore, the interns reported being awake 96.1 percent of the time they were in the hospital. It was also concluded that by working these extended shifts, interns pose a serious preventable safety hazard to themselves and to other motorists, which has important implications to scheduling practices in medical residency programs.

(Barger LK, Cade BE, Ayas NT, et al. "Extended Work Shifts and the Risk of Motor Vehicle Crashes Among Interns." *New England Journal of Medicine*. 352: 125-134; January 13, 2005.)

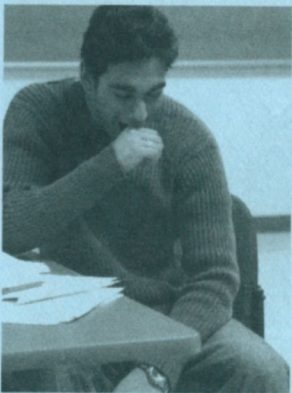
**"...It was concluded that after an extended shift, the odds that interns will have a documented motor crash doubled compared to those who completed nonextended hour shifts."**



**"Medical Education Highlights for Primary Health Care"**



## Interns and Serious Medical Errors Due to Lack of Sleep



When interns are on shifts that are 24 hours or longer, they make more serious medical errors than when they work fewer hours. The Harvard Work Hours, Health, and Safety Group concluded that a reduction in the number of hours that interns work could reduce serious medical errors. As far back as 33 years ago, a study of interns who worked 24 or more hour shifts made up to twice as many errors reading electrocardiograms than

after a night of sleep. Similarly, recent studies have shown that surgical residents made more technical errors after working overnight than those who performed laproscopic surgery after a night of sleep.

A survey of house officers reported that they made 41 percent more errors due to fatigue. They also indicated that 31 percent of these events resulted in fatalities. The Harvard study took place at Brigham and Women's Hospital in the medical intensive care unit and the coronary care unit because the rotations were the longest and they had higher rates of serious medical errors in these critical care settings than elsewhere in the hospital. The study involved 634 admissions with 2,203 patient days and showed that interns made 36 percent more serious medical errors on an extended work schedule compared to those who did not have extended work shifts.

While the Institute of Medicine's report "To Err is Human" did not refer to sleep deprivation being related to medical error, the Harvard study filled this gap by observing an association between lack of sleep and the high risk of medical errors in critical care units. Since more than 100,000 physicians are currently in training in the United States, the results of this study have serious implications regarding health policy. Thirty-hour shifts are still permitted even since the scheduling reforms instituted by the Accreditation Council on Graduate Medical Education.

(Landrigan CP, Rothschild JM, Cronin JW, et al. "Effect of Reducing Intern's Working Hours on Serious Medical Errors in Intensive Care Units." *New England Journal of Medicine*. 351: 1838-1848; October 28, 2004.)

## Medical Student Debt



The Association of American Medical Colleges (AAMC) indicated in a March 2005 report that if educational debt continues to rise at the current level and the income of physicians barely keeps up with inflation, there is concern about

the affordability of medical education. These concerns also affect all the health professions. In addition, this can also adversely affect the nation's health care by impeding the supply of physicians and its diversity.

During the last 20 years, only 20 percent of medical students came from families with incomes that were in the lowest three-quintiles of the population. Another concern is that while interest rates on student loans have been relatively low, it is expected that they will rise significantly in the next few months. While only one fifth of medical students complete their education without loans, some have loans that exceed \$200,000. The AAMC recommends that students should receive annual communications about medical school financing and assist them in learning the complex nature of medical school funding.

Applicants need to be informed about the cost of medical education and the average amount of debt they may incur as well the overall cost of their degree. Sources of financial aid including loans, scholarships, and loan forgiveness need to be found to prevent an adverse impact on the diversity of the applicant pool and the medical student population. Creative means of getting money on a local, state, and national level should be created. Creative ways to fund medical education should focus on physicians in training providing service to the uninsured and underserved.

("Medical Educational Costs and Student Debt." Association of American Medical Colleges; March 2005.)

## Teaching Medical Ethics in Japan



The Defining Issues Test (DIT) is a multiple-choice instrument used to evaluate moral reasoning. Since it was designed for medical ethics, it was translated to the Japanese clinical setting and referred to as the Problem Identification Test (PIT).

The purpose was to measure the following:

- to develop a brief objective method of evaluation for moral sensitivity and reason
- to conduct a test battery for the PIT and DIT on medical trainees who either are in school or are residents
- to investigate changes in moral sensitivity and reasoning between the medical school years and residency

The Japanese version of PIT had the following vignettes:

- a Jehovah's Witness who denies blood transfusion
- treatment of a premature infant
- treatment of a terminal patient

The 539 medical students and 100 residents were asked to list all the medical ethics issues related to each case, which were scored according to the number of issues identified. The vignettes encompassed the domains of autonomy and patients' rights, beneficence and nonmaleficence, and justice and contextual features.



The Japanese version of DIT has six vignettes, of which two are considered to be the most relevant to medical ethics:

- whether or not to steal medicine to save one's wife
- euthanasia on a terminal patient who is experiencing great pain

Analysis of DIT provided results that included

- changes in decision making between medical students and residents
- moral development stage (moral reasoning)

PIT results indicated significant increases in fourth- and fifth-year students in the six-year medical school program, which then dropped in the sixth year and in residency. DIT results indicated substantial differences in decision making between school years (i.e., euthanasia and theft of medications).

(Akabayashi A, Slingsby BT, Kai I, Nishimura T, and Yamagishi A. "The Development of a Brief and Objective Method for Evaluating Moral Sensitivity and Reasoning in Medical Students." *BMC Medical Ethics*. 5:1; 2004.)

### Medical Student Knowledge of the Health Care System



A national survey consisting of a random sample of 640 first-year and 940 fourth-year medical students was performed to assess their knowledge of the U.S. health care system. This was done because of the concern about how prepared they were to inherit a system in crisis. This crisis includes such issues as the escalating cost of health insurance (8 percent rate) and the fact that 1-in-7 Americans are not insured—with such

numbers rising. In addition, there continues to be racial and ethnic disparities. There were a total of 770 respondents (57 percent first year and 56 percent fourth year) with 65 percent of females responding versus 53 percent of males. Survey questions assessed the knowledge they had of health care delivery and financing, health care access, differences in knowledge about health care by year in medical school, satisfaction in teaching about health care, and suggestions for curricular reform.

The study was able to identify a number of gaps in the knowledge medical students had about the U.S. health care system. Among them was that while they knew health care access for the uninsured was a major problem, there was little knowledge about its magnitude and demographics. They also showed little knowledge about the performance of the U.S. health care system compared to other nations and the financing of care in this country. Students reported concerns about the content and effectiveness of medical school curricula. The investigators recommended that medical educators consider expanding and enhancing health policy curricula to improve the system in which students will be working.

(Agrawl JR, Huebner J, Hedgecock J, et al. "Medical Students' Knowledge of the U.S. Health Care System and the Preferences for Curricular Change: a National Survey." *Academic Medicine*. 80: 484-488; 2005.)

### Oral Health in the Medical School Curriculum



The Surgeon General's Conference on Children and Oral Health and the Surgeon General's Report on Oral Health in 2000 described the importance of including oral health in undergraduate medical education. Failure to integrate medical and dental knowledge into the curriculum and have collaboration between medical and dental practitioners will adversely affect oral health disparities. These disparities are due to

the historic separation of the study of the mouth from the study of the body. This needs to be reinforced by including oral health content in residency training as well. Furthermore, it should be included in the questions that are part of examinations given by the American Board of Pediatrics as well as be incorporated as an interest area in oral health in the Society of Teachers of Family Medicine and in continuing education for practitioners. The report also emphasized that primary care physicians in underserved areas are in the best position to prevent oral disease, identify it early, and build linkages with dentists.

The University of Washington proposed goals and objectives in oral health for medical students including targeted courses in which these would be provided. They include instruction in the areas of dental public health, caries, periodontal disease, oral cancer, and oral-systemic health interaction. In addition to these knowledge objectives were attitudinal objectives (awareness of the importance of oral health, the physician's role in prevention and early identification, and physician-dentist collaboration), competencies including clinical skills that physicians need to have, and implementing the curriculum throughout the medical school curriculum.

(Mouradian WE, Reeves A, Kim S, et al. "An Oral Health Curriculum for Medical Students at the University of Washington." *Academic Medicine*. 80: 434-442; 2005.)

### A Blind Student Becomes a Physician

Over the course of two weeks, a medical student at the University of Wisconsin – Madison performed the task of intubating patients several times. He earned his medical degree with honors in the top sixth of his class with only one grade of B. The unique aspect of this story is that Tim Cordes is one of just a very few blind physicians in the United States. Using special devices and technology, he was able to learn how to identify nerves and vessels in cadavers, study x-rays, read EKGs and patient charts, examine microscope slides visualizing brain tissues, and even describe skin lesions. He accomplished this through the use of raised-line drawings, a computer simulator that simultaneously converts images to words connected to an earpiece, employing a portable printer so he can make chart entries, and through the use of an Optacon that has vibrating pins that help him feel images. Diagnosed with Leber's disease at five months of age, he wore glasses at age two and then gradually became sightless. At 16, he began using a guide dog.

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### **A Blind Student Becomes a Physician continued...**

Prior to entering medical school, he attended the University of Notre Dame, where he graduated valedictorian. Dr. Cordes completed medical school in December 2004 and is currently pursuing a Ph.D. studying the structure of a protein associated with pneumonia and other infections, spending 10-to-12 hours in the laboratory each day. He also is a black belt in both tae kwon do and jujitsu. While he thought about becoming a researcher, he is now considering becoming a psychiatrist or internist. This fall, Dr. Cordes will be marrying a fellow member of Mensa who holds a Ph.D. in pharmacology and currently is in medical school.

*("Blind Student Earns M.D." CNN.com; Madison, Wisconsin. Associated Press. April 2, 2005.)*



Health Professions Division  
College of Osteopathic Medicine  
3200 South University Drive  
4th Floor, Room 1495  
(954) 262-1469  
Fort Lauderdale-Davie, FL 33328-2018  
<http://medicine.nova.edu>

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**Editor**

Leonard Levy, D.P.M., M.P.H.  
Associate Dean

**Associate Editor**

Scott Colton, B.A.  
Director of Medical Communications

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